Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 through 7 (Cancelled)

Claim 8. (Currently amended) A method of decoding q-ary encoded information symbols where q is a plural integer, comprising the steps of:

providing, without any backwards computation, for each possible state of a decoding trellis at an information symbol time, q probability vectors for reaching the state via path of δ information symbols of the trellis, and a total probability of reaching the state, an updating the probability vectors and total probability for the each possible state at a next information symbol time by the steps of:

(a) determining a probability for each of q possible transition paths from a state at said one information symbol time to the state at said next information symbol time;

(b) determining the total probability of reaching the state at said next information symbol time from the probabilities of the q possible transition paths to said state at said next information symbol time; and

(c) for each q possible encoded information symbol values at the each possible state at said next information symbol time, merging respective the probability vectors for [states] the each possible state at said one information symbol time in accordance with the respective probabilities of the transition paths from [such states] the each possible state at said one information symbol time to the state at said next information symbol time; and

(d) determining a probability for an information symbol that is δ information symbols before said next information symbol time from respective elements of [said] the probability vectors for all of [the] possible states at [a respective] said one information symbol time;

wherein steps (a), (b), (c) and (d) are performed for each and every transition path and steps (b), (c) and (d) are performed for each and every information symbol.

Claim 9. (Original) A method as claimed in claim 8 wherein each probability vector provides

logarithmic probabilities.

Claim 10. (Currently amended) A method as claimed in claim 8 wherein the q probability vectors for each possible state are represented by q-1 vectors of probability ratios.

Claim 11. (Currently amended) A method as claimed in claim 10 wherein each probability vector provides logarithmic probability ratios.

Claim 12. (Original) A method as claimed in claim 10 wherein q =2.

Claim 13. (Original) A method as claimed in claim 8 wherein q =2.

Claim 14. (Currently amended) A method as claimed in claim 8 and further including the step of, for each [information] symbol time, normalizing the total [probabilities for all of the states] total probability for the each possible state.

Claim 15. (Currently amended) A method of decoding encoded binary information symbols comprising the steps of:

updating, without any backwards computation, for successive symbol times a vector of logarithmic probability ratios for each state of a decoding trellis at a respective symbol time, each vector of logarithmic probability ratios corresponding to a survivor path through the decoding trellis, each logarithmic probability ratio representing in a logarithmic domain a ratio of the relative probabilities of [the] a symbol representing a binary one [of] or a binary zero, the updating comprising:

(a) determining probabilities for reaching each state via respective transition paths corresponding to binary one and zero values of the information symbols from respective states at a previous symbol time;

(b) combining said determined probabilities to determine a total probability of reaching the state;

and

(c) for binary one and zero information symbol values at each state, merging

respective probability vectors for [the] respective states at said previous information symbol time in accordance with [the] at least one respective [probabilities] probability of the transition paths from such states of a decoding trellis; and

(d) determining [a] the probability ratio for [an] the information symbol at [the] a start of the survivor path from elements of [the vectors] at least one vector for all of [the] possible states of the decoding trellis at [a] the respective information symbol time;

wherein steps (a), (b), (c) and (d) are performed for each and every transition path and steps (b), (c) and (d) are performed for each and every information symbol.

Claim 16. (Currently amended) A method as claimed in claim 15 and further including the step of, for [each] the respective information symbol time, normalizing [the] at least one total [probabilities] probability for all of the possible states.

Claim 17. (Currently amended) A decoder arranged to carry out [the] a method [of claim 15.] comprising the steps of:

updating, without any backwards computation, for successive symbol times a vector of logarithmic probability ratios for each state of a decoding trellis at a respective symbol time, each vector of logarithmic probability ratios corresponding to a survivor path through the decoding trellis, each logarithmic probability ratio representing in a logarithmic domain a ratio of the relative probabilities of a symbol representing a binary one or a binary zero, the updating comprising:

(a) determining probabilities for reaching each state via respective transition paths corresponding to binary one and zero values of the information symbols from respective states at a previous symbol time;

(b) combining said determined probabilities to determine a total probability of reaching the state;

and

(c) for binary one and zero information symbol values at each state, merging respective probability vectors for respective states at said previous information symbol time in accordance with at least one respective probability of the transition paths from such states of a decoding trellis; and

(d) determining the probability ratio for the information symbol at a start of the survivor path from elements of at least one vector for all of possible states of the decoding trellis at the respective information symbol time;

wherein steps (a), (b), (c) and (d) are performed for each and every transition path and steps (b), (c) and (d) are performed for each and every information symbol.

Claim 18. (Currently amended) A method of decoding encoded binary information symbols comprising the steps of:

updating, without any backwards computation, for successive symbol times two vectors of logarithmic probabilities for each state of a decoding trellis at a respective symbol time, each vector corresponding to a survivor path through the decoding trellis, each logarithmic probability of the two vectors representing in a logarithmic domain a probability of [the] an information symbol representing a binary one or a binary zero respectively, the updating comprising:

determining probabilities for reaching each state via respective transition paths corresponding to binary one and zero values of the information symbols from respective states at a previous symbol time;

combining said determined probabilities to determine a total probability of reaching the state; and

for binary one and zero information symbol values at each state, merging respective probability vectors for [the] respective states at said previous information symbol time in accordance with the respective probabilities of the transition paths from such states; and

determining a probability ratio for [an] the information symbol at [the] a start of the survivor path

from elements of the vectors for all of [the] possible states of the decoding trellis at [a] the respective information symbol time.

Claim 19. (Currently amended) A method as claimed in claim 18 and further including the step of, for each [information] symbol time, normalizing the total [probabilities for all of the states] probability for each state.

Claim 20. (Currently amended) A decoder arranged to carry out [the] a method [of claim 18.] comprising the steps of:

updating, without any backwards computation, for successive symbol times two vectors of logarithmic probabilities for each state of a decoding trellis at a respective symbol time, each vector corresponding to a survivor path through the decoding trellis, each logarithmic probability of the two vectors representing in a logarithmic domain a probability of an information symbol representing a binary one or a binary zero respectively, the updating comprising:

determining probabilities for reaching each state via respective transition paths corresponding to binary one and zero values of the information symbols from respective states at a previous symbol time;

combining said determined probabilities to determine a total probability of reaching the state; and

for binary one and zero information symbol values at each state, merging respective probability vectors for respective states at said previous information symbol time in accordance with the respective probabilities of the transition paths from such states; and

determining a probability ratio for the information symbol at a start of the survivor path from elements of the vectors for all of possible states of the decoding trellis at the respective information symbol time.